

Work Order ID 67440

Monday, March 21, 2011 10:24:07 AM

Page 1

Item ID: D212-664-101

Accept

Revision ID:

Item Name: Crosstube Fwd

Start Date: 3/21/2011 Start Qty: 1.00

Required Date: 4/8/2011 Req'd Qty: 1.00

Reference:

Approvals:

Process Plan:

Date: 11-03-21

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Draw Nbr

Revision Nbr

D212-664-141

Rev D

100

0.00



DC

Document Control

DOCUMENT CONTROL

Memo

0.00

Photocopy bluefile and create labels as per PPP D212-664-101 CHG003

Dulaylog

110

0.00



Packaging

Packaging

Pick Kit

Packaging

Memo

0.00

120

0.00



CNC Bend 2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

0.00

Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio D212-664-101

DP

11-4-2

DP

11-4-2

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 67440

Monday, March 21, 2011 10:24:07 AM

Page 2

Item ID: D212-664-101

Accept

Revision ID:

Item Name: Crosstube Fwd

Start Date: 3/21/2011 Start Qty: 1.00

Required Date: 4/8/2011 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

140

Crosstubes

0.00



Crosstubes

Memo

0.00

Crosstubes

1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549, using drill table DT8577, set-up towers in hole #7 as per QSI 10

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

SAD
11-04-04

11-4-2

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 67440

Page 3

Monday, March 21, 2011 10:24:07 AM

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 3/21/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 4/8/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 HandFXtube	Crosstubes Chemical Conversion	0.00							
Hand Finishing Crosstubes	Memo Chemical Conversion Coat within 24 hours of bending and drilling	0.00	SAD	11-04-04		①			
160 QC	QC5- Inspect part completeness to step on W/O	0.00							
Quality Control	Memo	0.00	8	ul04104		②			
170 Outsource2	Outsource process - NDT per QSI038 4.1	0.00							
Outsource process - NDT	Memo Liquid Penetrant Inspection as per QSI 038 Issue P/O: 13801 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	0.00				C2	11/04/05	①	

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 67440

Monday, March 21, 2011 10:24:07 AM

Page 4

Item ID: D212-664-101

Accept

Revision ID:

Item Name: Crosstube Fwd

Start Date: 3/21/2011 Start Qty: 1.00

Required Date: 4/8/2011 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

Receive & Inspect for Damage & Mat'l Certs
Packaging

0.00



Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

PC 11/4/10 U

190

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

Inspect for damage & ensure results are as per Dwg D212-664-141

ET 11-04-05

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 67440

Monday, March 21, 2011 10:24:07 AM

Page 5

Item ID: D212-664-101

Accept

Revision ID:

Item Name: Crosstube Fwd

Start Date: 3/21/2011 Start Qty: 1.00

Required Date: 4/8/2011 Req'd Qty: 1.00



Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start
Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200	Spray Painting per QSI005 4.2	0.00							
 SprayPaint	SprayPaint								
	Memo	0.00							
	1-Prime inside and outside crosstube as per QSI 005 4.2								
	2-Paint outside crosstube with White Imron as per QSI 005 4.2								
	PRIME:								
	Start Time: _____								
	Finish Time: _____								
	PAINT:								
	Start Time: _____								
	Finish Time: _____								
210	QC14- Inspect Spray Paint	0.00							
 QC									
Quality Control	Memo	0.00							
	Then, Wrap in plastic bag to protect from scratches								

11-04-06

Pto

11-04-06

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO: 67440

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11-04-05	200	Prime outside surface of tube using Temp epoxy primer allow primer to become tack Free, clean coat specified area as per OSI without masking, being sure to coat slightly wider than the specified 2" wide x 2" away from	BT	11-04-05		11/24/05	S. Moulton
		each cuff on inside of tube, using 3005 inson clear, allow to dry overnight Mask area to remain primer, scrub + paint rest of tube inson inson white	BT	11-04-05		11/24/05	S. Moulton
			BT	11-04-06		11/24/05	S. Moulton

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:

WORK ORDER NON-CONFORMANCE (NCR)

DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 67440

Monday, March 21, 2011 10:24:07 AM

Page 6

Item ID: D212-664-101

Accept

Revision ID:

Item Name: Crosstube Fwd

Start Date: 3/21/2011 Start Qty: 1.00

Required Date: 4/8/2011 Req'd Qty: 1.00

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

220



Crosstubes

Crosstubes

Memo

0.00

0.00

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe
2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs
A/R 6398 Magnobond Batch: 116673
3- Torque bolts as per dwg

25 11-04 08

230



QC

Quality Control

QC6- Inspect dimensions to drawing

Memo

0.00

0.00

11 11 029 08 (1)

240



Packaging

Packaging

Pick Kit

Memo

0.00

0.00

11/4/85

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 67440

Monday, March 21, 2011 10:24:08 AM

Page 7

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Item Name: Crosstube Fwd

Stop



Start Date: 3/21/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 4/8/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
250 QC Quality Control	QC4- 100% Inspect kits for completeness Memo	0.00 0.00							
260 Packaging Packaging	Packaging Memo Identify and pack for shipping as per PPP D212-664-101	0.00 0.00							
270 QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 0.00							 11-04-08

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Monday, March 21, 2011 10:24:13 AM

Page 1

Work Order ID: 67440

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd



Start Date: 3/21/2011

Required Date: 4/8/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat KJ/DS
IPP Rev:F 06-03-29 Remove Comments on Pick List JLM
IPP Rev:G 07-04-30 As per Rev C JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664-101 TRN		Manufactured	No			110	Each	0.0000	1	1			
						B67571						SAD 11-04-02	
Crosstube Turning Detail													
D3595-063-450		Manufactured	No			230	Each	65.4590	4	4.210526			
						B67353						21 11-04-07	
RUBBER CUSHION													

Location

Loc Qty

Loc Code

LG055

60.45897368

53775

5.97897368

58161

3.56

59580

0.12

61465

4.68

63960

10

65656

2.12

67067

34

ST415

5

64171

4

64300

1

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Monday, March 21, 2011 10:24:13 AM

Page 2

Work Order ID: 67440

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 3/21/2011

Required Date: 4/8/2011

Start Qty: 1.00

Required Qty: 1.00

MS21920-25

Purchased

No

220

Each

80.0000

4

4



Clamp(per MIL-DTL-8783C)

MS21920-24

W 107441

Location

Loc Qty

Loc Code

LG050

80

109181

1

113281

5

113282

18

113744

1

114759

5

114901

3

115278

1

115849

12

116264

34



ET 11-04-07

Pto

D2893-1

Manufactured

No

220

Each

3.0000

2

2



2.75 Support

66698

Location

Loc Qty

Loc Code

LG052

3

63367

3

D3428-1

Manufactured

No

240

Each

27.0000

1

1



Placard

Location

Loc Qty

Loc Code

ST053

27

63978

3

66115

12

66961

12



11/1/850

Monday, March 21, 2011 10:24:13 AM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
11-04-08	220	MS21920-25 no more stock MS21920-26 too big use MS21920-24 clamp as temporary replacement MS21920-24 m107441 x4	ET	11-04-08		11-04-08 AS1042		

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Monday, March 21, 2011 10:24:13 AM

Page 3

Work Order ID: 67440

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd



Start Date: 3/21/2011

Required Date: 4/8/2011

Start Qty: 1.00

Required Qty: 1.00

AN6-35A Purchased No 240 Each

86.0000

4



BOLT



Location

Loc Qty

Loc Code

ST343

86

115698

20

115742

16

116528

50

AN6-36A Purchased No 240 Each

66.0000

4



Bolt



Location

Loc Qty

Loc Code

ST343

66

115698

30

115835

1

116400

5

117010

30

MS21042L6 Purchased No 240 Each

207.0000

6



Nut



Location

Loc Qty

Loc Code

ST300

207

111578

4

116102

3

116373

100

116548

100

AN960JD616 NAS1149D0663J Purchased No 240 Each

0.0000

18



Washer



Handwritten notes and signatures:

- For AN6-35A: 4, signature
- For AN6-36A: 4, 1x, M112313, signature
- For MS21042L6: 3, 6, signature
- For AN960JD616: 6, 18, M11628, 4/4/8, signature

Monday, March 21, 2011 10:24:14 AM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

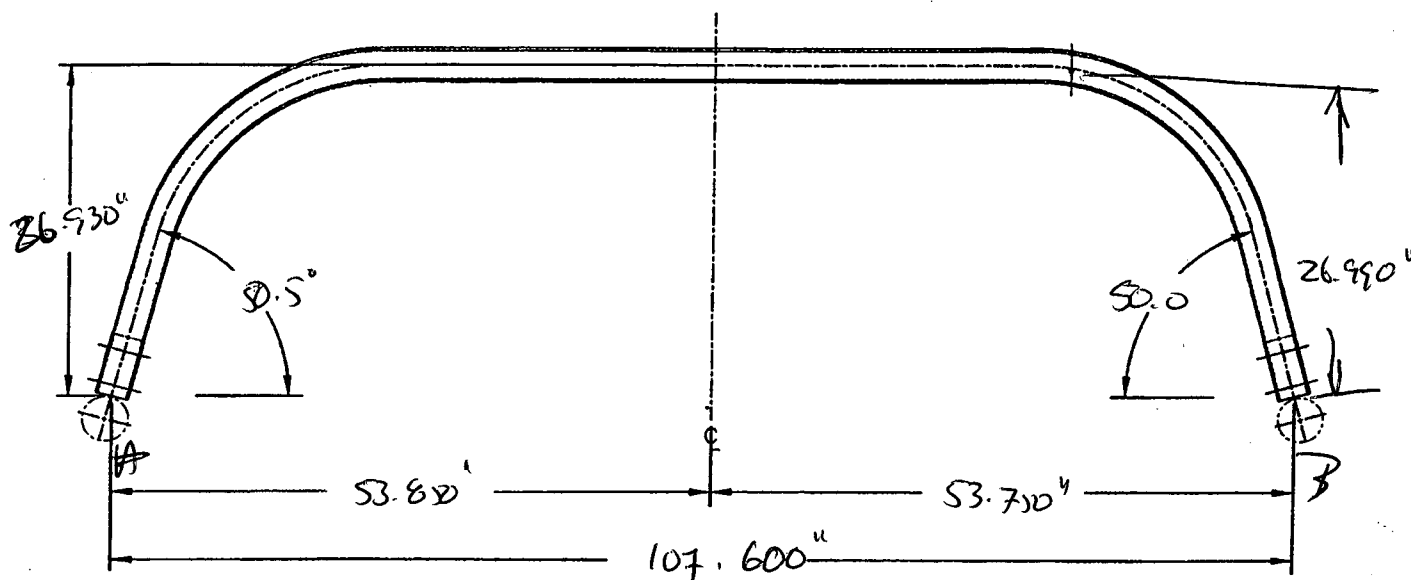
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	17440
Description: Crosstube High Fwd (205/212/412)		Part Number:	D212-664-101
Inspection Dwg: D212-664-141 Rev: D		Page 1 of 1	

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7



Comments

QC15 Inspection	8
Date	11/24/02

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.31	Dimensions updated per Dwg Rev C	KJ/JM	
C	10.04.01	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	Qty -141	Qty -141B	Part Number	Description
1	X		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS
- 7) WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS
6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF
D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE
SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND
MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT
HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 67940
PL11-0321

RELEASED
2009-10-29

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DRAWN	PH	RF	
CHECKED	PH		
MFG. APPR.	PH		
APPROVED	PH		
DE APPR.	PH		
DATE	09.09.30		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D212-664-141	REV. D SHEET 1 OF 4
TITLE XTUBE ASS'Y (205/212/412 HI FWD)	SCALE NTS
COPYRIGHT © 2009 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

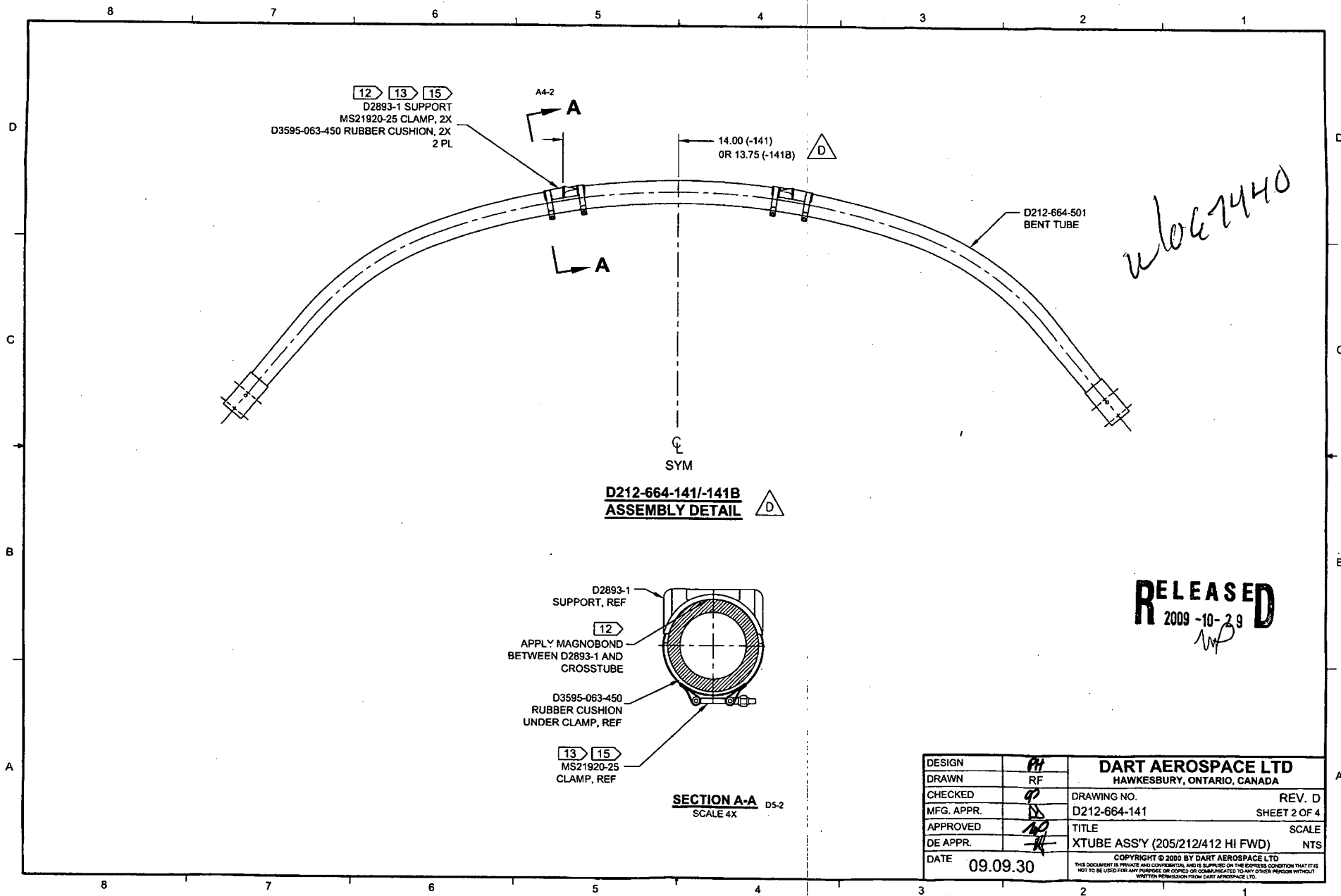
W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. D
MFG. APPR.	DS	D212-664-141	SHEET 2 OF 4
APPROVED	12	TITLE	SCALE
DE APPR.	12	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
DATE	09.09.30	<small>COPYRIGHT © 2005 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

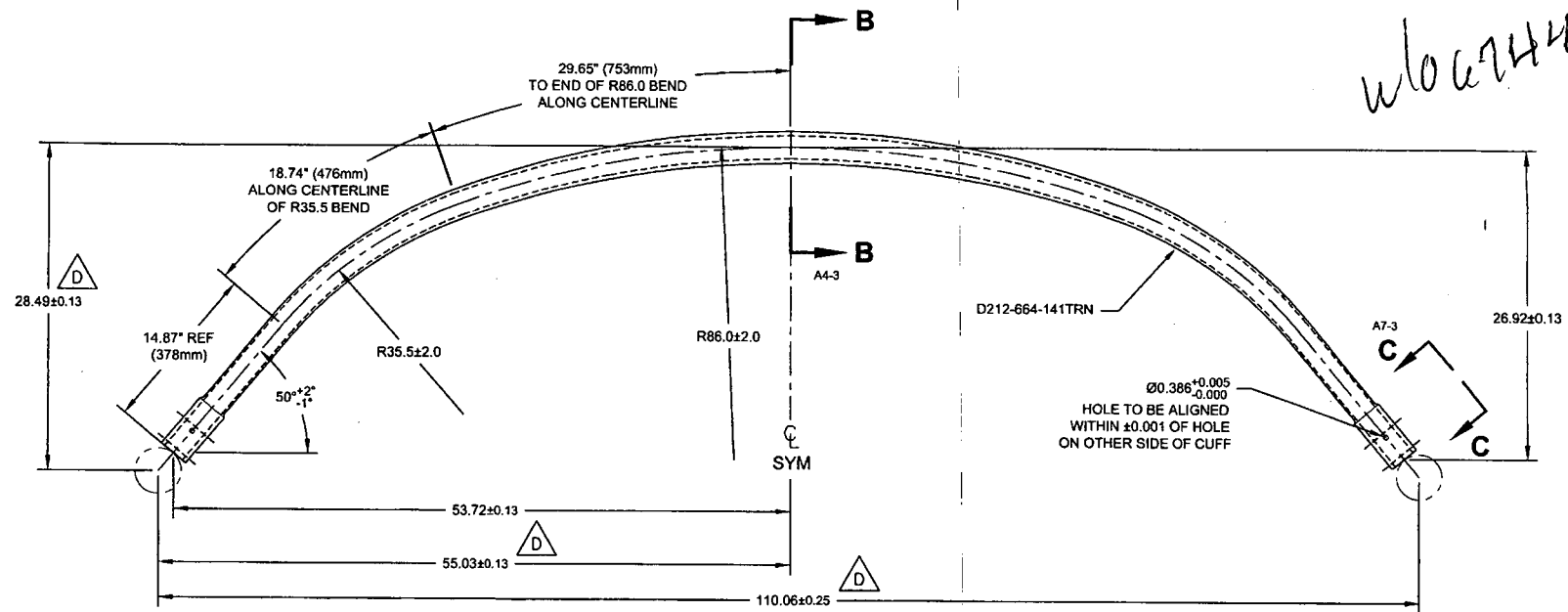
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

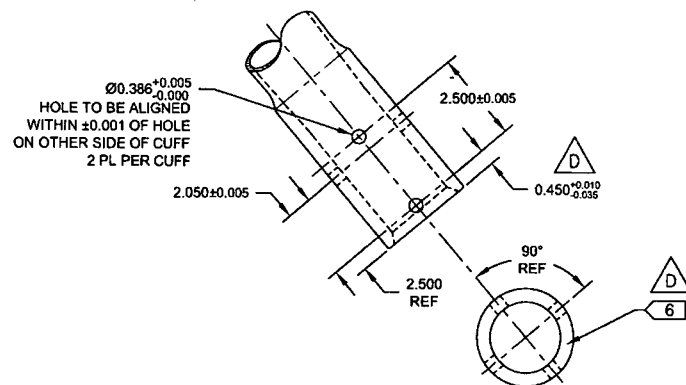
8 7 6 5 4 3 2 1

wlo 67440

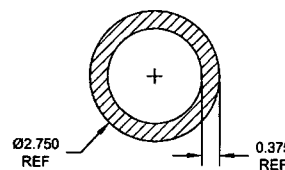


D212-664-501
BENDING AND DRILLING DETAIL

10 D



VIEW C-C: CUFF DETAIL C2-3
SCALE 3X



SECTION B-B C4-3
SCALE 4X

RELEASED
2009-10-29
MD

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. D
MFG. APPR.	18	D212-664-141	SHEET 3 OF 4
APPROVED	10	TITLE	SCALE
DE APPR.	11	XTUBE ASSY (205/212/412 HI FWD)	NTS
DATE	09.09.30	<small>COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1

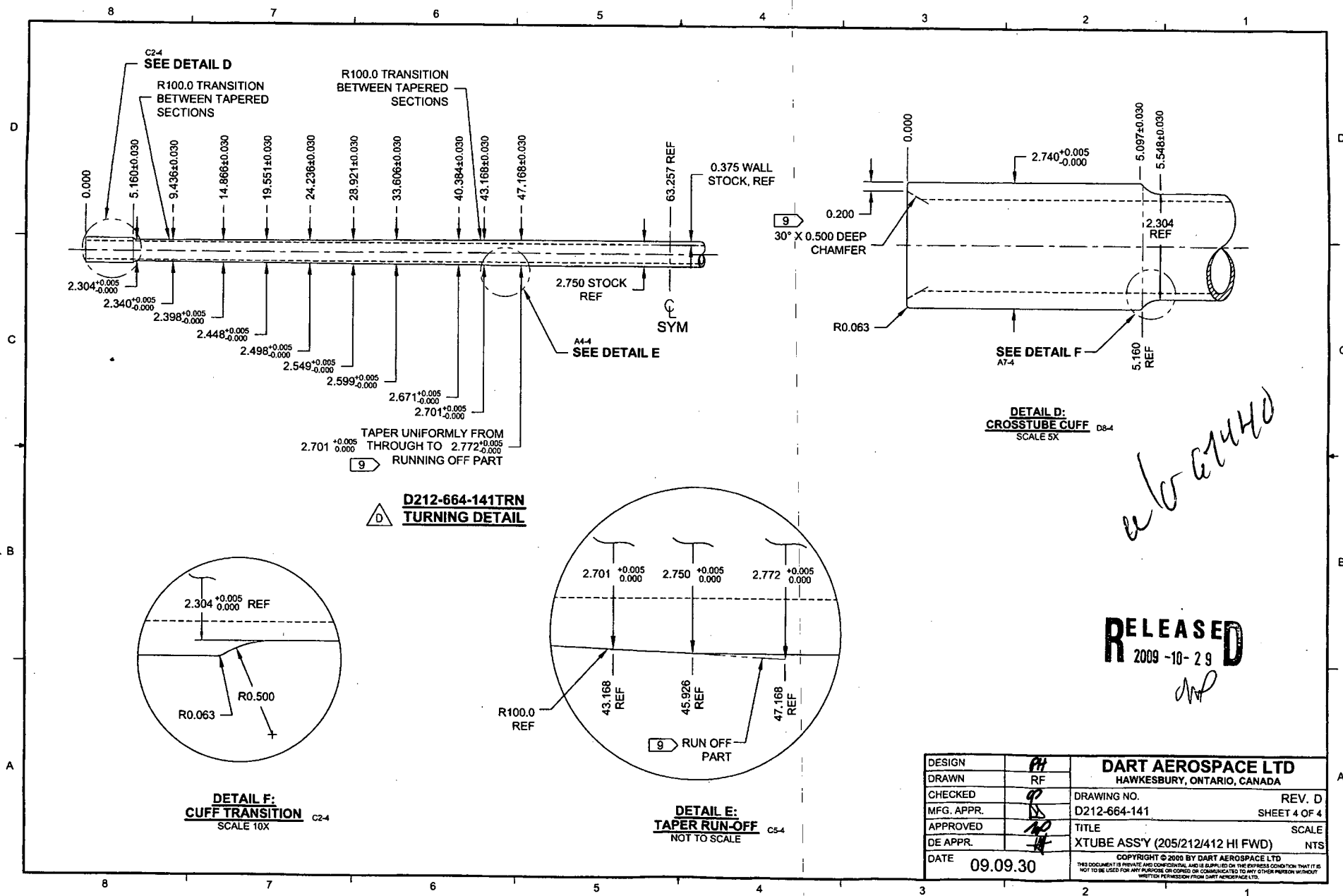
W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng				Sign & Date

NOTE: Date & initial all entries



W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



RAPPORT D'INSPECTION PAR RESSUAGE

P- 12618

PAGE 1 DE 1

CLIENT DART AEROSPACE
ATTENTION LINDA CHANTE
ADRESSE 1270 ABERDEEN ST
HAWKESBURY, ONTARIO
PROJET FPI ON 10 CROSSTUBE
ITEM(S) EXAMINÉ

DATE 2011-04-05 HEURE 7:30 ☒ AM ☐ PM
N° TRAVAIL 188-11-02070
ACUREN
N° CLIENT PO/WO 13801
SITE DE TRAVAIL HAWKESBURY
ACCEPTATION STD. ASTM E1417 / Q51-03B DATE/REV. 2005

DESCRIPTION DES TRAVAUX N° PROCÉDURE LT-002 DATE/REV. 2008 N° TECHNIQUE LT-002 DATE/REV. 2008

N° ITEMS MATÉRIEL ALUMINUM ÉPAISSEUR VARS
DESCRIPTION wet Fluorescent Liquid Penetrant Inspection
CARRIED OUT ON 100% EXTERNAL SURFACE

DÉTAILS DES INSPECTIONS

MÉTHODE : ☒ FLUORESCENT ☐ VISIBLE ☒ LAVABLE À L'EAU ☐ MÉTHODE DISSOLVANT ☐ PRÉ-ÉMULSIONNANT
MARQUE : MAENAP/LA LUM. NOIRE S/N 640423 PUISS. > 1 000 µ W/cm² ☐ AMBIANT < 2 fc
PÉNÉTRANT : 2LG7 TEMPS PÉNÉTRATION MIN. 45 MIN. ÉQUIP. LUMIÈRE ☒ LAMP. POCHE ☐ LAMP. CULASSE ☐ PUISS. > 100 fc @ SURFACE
DISSOLVANT PÉNÉTRANT H2O TEMPS SÉCHAGE MIN. > 10 MIN. AUTRES
RÉVÉLATEUR SD52 TEMPS RÉVÉLATION MIN. 10 MIN. MÈTRE LUM. N/S DATE CAL DUE 07/19/2011
TYPE RÉVÉLATEUR ☐ NON AQUEUX ☐ AQUEUX ☐ SEC 1898866

SURFACE INSPECTÉE

CONDITION SURFACE ☐ MEULÉE ☐ SOUDÉE ☐ MACHINÉE ☐ MRENAILLÉE ☒ MÉTAL PROPRE
TEMPÉRATURE SURFACE ☐ < - 4°C/20°F ☐ - 4°C/20°F À 10° C/50°F ☒ 10°C/50°F À 52°C/125°F ☐ > 52°C/125°F

RÉSULTATS (☐ MÉTRIQUE ☐ IMPÉRIALE)

ITEM	COMMENTAIRES	ACCEPTÉ	REJETÉ
1	CROSSTUBE WO 66346	✓	
1	CROSSTUBE WO 67211	✓	
1	CROSSTUBE WO 67210	✓	
1	CROSSTUBE WO 65700	✓	
1	CROSSTUBE WO 65699	✓	
1	CROSSTUBE WO 67868	✓	
1	CROSSTUBE WO 67869	✓	
1	CROSSTUBE WO 67439	✓	
1	CROSSTUBE WO 67440	✓	
1	CROSSTUBE WO 66345	✓	

Étendue des Services

L'entente selon laquelle le Groupe Acuren Inc. Exécute les services ne concerne que les énoncés par écrit. En aucune circonstance ces services ne s'étendent au-delà de l'exécution des services demandés. Il est entendu que toutes les descriptions, les observations et les expressions d'opinions faites par Acuren reflètent les opinions ou les observations de l'entreprise fondées sur l'information et les hypothèses fournies par le propriétaire/opérateur, et elles ne constituent pas des déclarations ou des garanties ou ne peuvent être interprétées comme constituant. Le Groupe Acuren Inc. N'assume aucune des responsabilités du propriétaire/opérateur, et le propriétaire/opérateur conserve la responsabilité entière des décisions prises en matière d'ingénierie, de fabrication, de réparation et d'usage à partir de l'information ou des données fournies par Acuren en rapport avec les services décrits dans les présentes ne peuvent excéder le coût des services rendus.

Norme de Diligence

Dans l'exécution des services, le Groupe Acuren Inc. Applique le degré de diligence, le soin et la compétence normalement exercés dans des circonstances semblables par d'autres fournisseurs de ce type de services opérant dans la même localité ou dans une localité similaire. Aucune autre garantie, implicite ou explicite, n'est faite ou voulue par le Groupe Acuren Inc.

SIGNATURES

REPRÉSENTANT Matthew Shindler FTJ#:
TECHNICIEN (SIGNATURE): David P. Schuch MOULÉ SIGNATURE
NOM (MOULÉ): David P. Schuch 1^{er} TECHNICIEN 2^{ème} TECHNICIEN
ONGC NIVEAU 2 SNT NIVEAU _____ ONGC NIVEAU _____ SNT NIVEAU _____
ONGC N° REGISTRATION _____ ONGC N° REGISTRATION _____